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⑤④ Fencing tape.

⑤⑦ This invention provides a conductive tape for an electrifiable fence comprising a tape of woven or knitted construction having at least two conducting wires arranged longitudinally and integrally in the woven or knitted structure characterised by a bridging conductor carried in or on the knitted or woven structure and which is directed transversely across the two longitudinal conductors at intervals so that if a break occurs in one of the conductors the current path is capable of continuing via the bridging conductor.

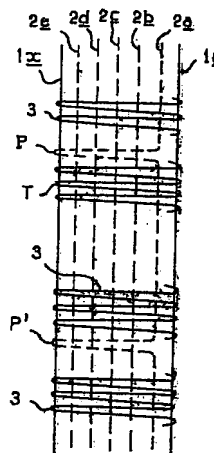


FIG. 1

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Description

FENCING TAPE

FIELD OF THE INVENTION

This invention concerns fencing tapes in particular those which contain conducting elements for use with electrifiable fences.

BACKGROUND OF THE INVENTION

We have experimented with a woven tape wherein the warps and weft are made of narrow plastic ribbon. The tape is rendered electrically conductive by the incorporation among the warps of several side by side fine gauge stainless steel wires. While this tape is an excellent conductor and offers good visibility to stock confined within a fence of which the tape is a part, faulty straining procedures or collisions between stock animals and the tape can spoil the conductivity of the tape and it is not unusual when testing the tape to find non conducting gaps in the fence which the animals subsequently find and exploit.

SUMMARY OF THE INVENTION

This invention provides a conductive tape for an electrifiable fence comprising a tape of woven or knitted construction having at least two conducting wires arranged longitudinally and integrally in the woven or knitted structure characterised by a bridging conductor carried in or on the knitted or woven structure and which is directed transversely across the two longitudinal conductors at intervals so that if a break occurs in one of the conductors the current path is capable of continuing via the bridging conductor.

The tape warps may be made of polyolefin for example polyethylene. The warps may include fine gauge stainless steel wires. There may be five such wires arranged equally across the width of the tape namely 20mm. Alternatively polyester yarn such as polyethylene terephthalate may be used. Other non conductive materials may be used.

The weft may be the same material as the warps. The bridging conductor may be a single wire strand which is inserted as a weft pick every 500mm or so. The bridging conductor would therefore pass from selvedge to selvedge for one pick and travel down one selvedge as an extra conducting warp strand. Alternatively the bridging conductor may be a conductor strand which is sewn into the tape in a serpentine path so as to cross from selvedge to selvedge in a continuous undulating pathway. In another application a continuous line of metallic composition is deposited on the face of the tape by a jet nozzle.

DESCRIPTION OF THE INVENTION

Embodiments of the invention are now described with reference to the accompanying drawings in which:

Figure 1: is a plan of a fragment of one embodiment of the tape and,

Figure 2: is a plan of a fragment of another

embodiment of the tape.

Figure 3: is a plan of a fragment of yet another embodiment of the tape.

DESCRIPTION OF THE EMBODIMENT

In a preferred embodiment, a tape is woven from polyethylene monofilaments and stainless steel wires in a weaving machine fed and controlled in such a manner that :

- the warp is made of a number of polyethylene monofilaments, and of a number of stainless steel wires equally spaced across the tape and all able to conduct current when incorporated into an electric fence ;
- the weft is a polyethylene monofilament ;
- one or several of the warp steel wires periodically becomes a weft wire, crossing with electrical contact the other warp steel wires.

For instance as schematically shown in figure 1, there are 24 warp polyethylene monofilaments 1 each 0,38 mm in diameter, 5 warp steel wires 2a to 2e each 0,15 mm in diameter and 1 weft polyethylene monofilament 3 having 0,30 mm in diameter and the width of the tape is about 14 mm. For the convenience of the drawing, only the two selvedge polyethylene warps 1e, 1x are shown whereas the five steel wires 2a to 2e are shown.

Outermost steel wire 2a is controlled to become at regular intervals a weft wire crossing the tape up to the opposite selvedge, the distance between two successive picks P,P' of such weft steel wire is about 65 mm and there are about 24 picks T of the polyethylene weft between the picks P,P'.

The numerical features are optional and may change according to the various embodiments.

Referring now to figure 2, the tape is woven without a bridging conductor. Instead the woven tape is fed into the path of a sewing machine (not shown) which inserts a bridging wire 4 in a serpentine path across the five warp wires. This can be arranged by placing the needle head between two pairs of laterally oscillating feed rolls. Alternatively the needle head can be oscillated.

Referring now to figure 3, the tape is knitted along with twenty three others on a warp knitting machine which utilises fifteen polyethylene warps of equal count and five stainless steel warp wires together with a bridging wire. During knitting the bridging wire passes down one selvedge crosses to the opposite selvedge in a diagonal path and travels along the opposite selvedge until it returns across a complementary diagonal. This creates a modified saw tooth wave path in the ribbon and allows the bridging wire to contact each conductor as it traverses from selvedge to selvedge.

The intervals between the diagonals are adjusted according to the intended end use of the tape. The interval may vary from 250-1250mm but the general purpose interval would be 500-750mm.

The tape is coloured orange, yellow, banded black and yellow but white is preferable. Our work

indicates that white tape is more visible than tapes of other colours, moreso than we would have expected having regard to the contrast against the backgrounds of greens, grass, sky and water wherein the tape is likely to be used.

We have found the advantages of the above embodiment to be:

1. The tape offers good visibility
2. The tape retains electrical conductivity despite breaks in the warp wires.

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12. A conductive tape as claimed in any one of the preceding claims wherein the non-conducting parts of the tapes are white.

13. A conductive tape substantially as herein described with reference to and as illustrated in Figure 1 or as modified by Figure 2 or 3.

Claims

1 A conductive tape for an electrifiable fence comprising a tape of woven or knitted construction having at least two conducting wires arranged longitudinally and integrally in the woven or knitted structure, characterised by a bridging conductor carried in or on the knitted or woven structure and which is directed transversely across the two or more longitudinal conductors at intervals so that if a break occurs in one of the conductors the current path is capable of continuing via the bridging conductor.

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2. A conductive tape as claimed in claim 1 wherein the tape is woven and the bridging conductor is a conductive strand incorporated as an intermittent weft pick.

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3. A conductive tape as claimed in claim 1 wherein the tape is warp knitted and the bridge conductor is a conductive strand incorporated as a warp thereof.

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4. A conductive tape as claimed in claim 3 wherein there are two outermost conductors at least one intermediate conductor and the bridging conductor extends at least from one outer most conductor to the opposite outer most conductor.

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5. A conductive tape as claimed in claim 1 wherein the bridging conductor is incorporated as a warp which becomes periodically a weft.

6. A conductive tape as claimed in claim 1 wherein the bridge conductor is a wire strand which is sewn into the tape in a serpentine path so as to cross from one outer most conductor to the opposite outer most conductor.

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7. A conductive tape as claimed in claim 1 wherein the bridge conductor is a continuous line of metallic composition deposited on a face of the tape by a jet nozzle.

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8. A conductive tape as claimed in claim 3 or 4 wherein the bridging conductor defines a square wave path in the tape.

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9. A conductive tape as claimed in any one of the preceding claims wherein the bridge conductor crosses the tape every 250-1250mm.

10. A conductive tape as claimed in any one of the preceding claims wherein the conductive strand is a wire.

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11. A conductive tape as claimed in any one of claims 1 to 8 wherein the conductive strand is a ribbon of electrically conductive plastic.

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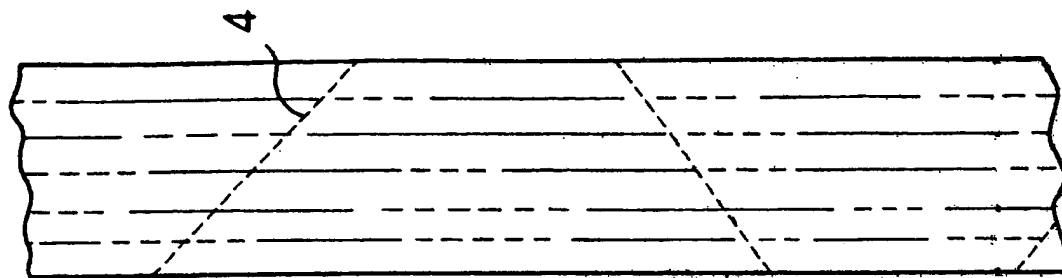


FIG. 3

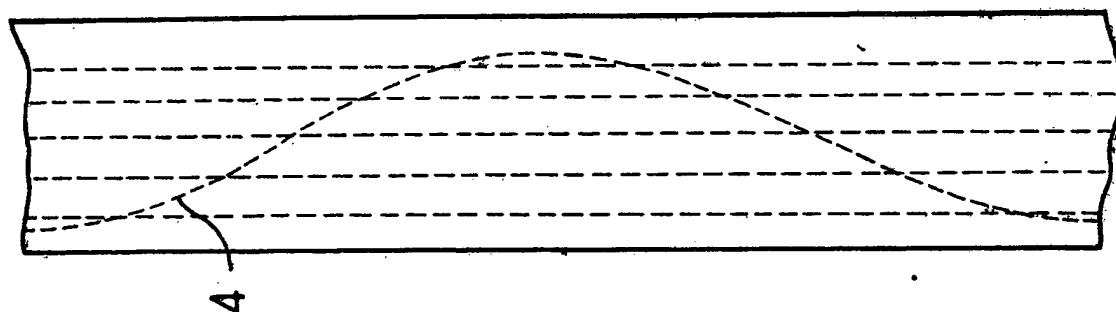


FIG. 2

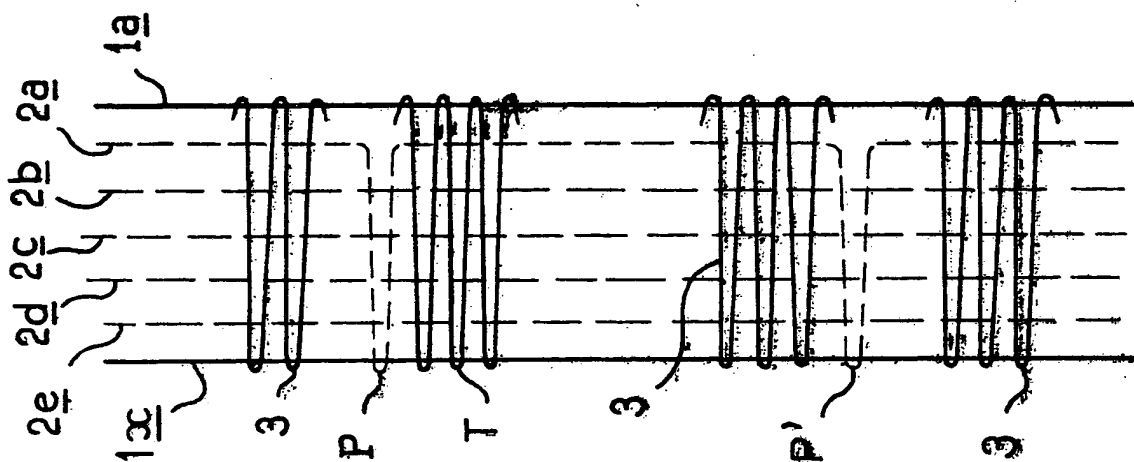


FIG. 1

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09.11.88 Bulletin 88/45(71) Applicant: GALLAGHER ELECTRONICS LIMITED
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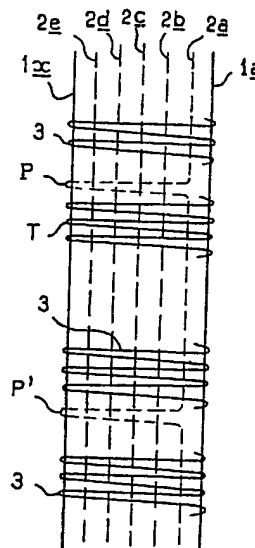


FIG. 1

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European Patent
Office

EUROPEAN SEARCH REPORT

Application Number

EP 88 40 0022

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 4)
Y	FR-A-1 416 613 (DOUNDOULAKIS) * Page 6, column 1, last paragraph - column 2, paragraph 1; figure 1 *	1,4	H 01 B 5/00 H 01 B 7/08
A	---	2-10	
Y	NL-A-7 710 230 (KRAAYENHOF) * Page 2, line 16 - page 3, claim 5; figure 1 *	1,4	
A	---	2,10	
Y	WO-A-8 500 556 (THORNTON) * Page 7, line 1 - page 10, line 20; figures 1-7 *	1,4	
A	-----	2,10,11	
			TECHNICAL FIELDS SEARCHED (Int. Cl. 4)
			H 01 B 7/00 H 01 B 5/00
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 29-08-1988	Examiner DEMOLDER J.
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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